

Knowledge and Practice of Handwashing among Health Care Workers as a Measure of Covid-19 Infection Prevention in Federal Medical Centre, Asaba

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Abstract

Background: COVID-19 is a respiratory tract infection which is responsible for the recent Pandemic with its socioeconomic and Health consequences. One way to control the spread of the disease is through hand hygiene. This study was done to examine the knowledge and practice of hand washing to limit COVID-19. **Method:** An institutional-based, cross-sectional study carried out among 247 Health care workers using systemic sampling. A standardized questionnaire used in a previous study was used to collect data. SPSS version 25 was used for data analysis. Statistical significance was set at 0.05. **Results:** Health care workers had good knowledge (92.0%) and practice (99.0%) of hand washing, respondent's profession (chi-square value = 618, p value = 0.001), and Gender (chi-square = 5234, p-value = 0.022) were statistically significant. **Conclusion:** Knowledge and practice of handwashing were generally good in Federal Medical Centre Asaba. However, conscious and targeted efforts should be maintained by hospital organizations in organizing regular training on Infection, Prevention. They should also make available running water and consumables for hand-washing exercises.

Keywords

Asaba, Hand-Washing, Healthcare-Workers, Knowledge, Practice

1. Introduction

COVID-19 is a communicable disease caused by the novel virus SARS-CoV-2, which causes respiratory illness [1] in humans. Researchers are still learning about the disease and think that the infection began in animals. At some point, one or more humans got the disease from an animal, and those infected humans started spreading the virus to other humans [2]. These findings showed a human to human transmission of this virus, which was consequently announced in more than 100 countries in the world [3]. The origin and spread of the disease are essential to be determined to develop preventive strategies to contain the infection [3].

In Africa, from figures shown by John Hopkin University, morbidity and mortality have continued to rise to 3,935,764 cases with a 274,655 death rate. In Nigeria as of the end of April 2020: there were 3526 cases with 107 deaths and ditto for other African countries [4]. A report from Nigeria Centre for Disease Control revealed that Lagos State was the Epicenter of COVID-19 infection with 79 cases out of a total of 239 cases in the country as of 9th May 2020.

The virus is spread through direct interaction with a respiratory droplet from humans or aerosol of an infected person generated through coughing, sneezing, and touching surfaces that have been contaminated with the virus [5]. To date, there is no specific vaccine or medicine for COVID-19. Prevention is by observing hand hygiene and other COVID-19 protocols.

Hands are considered the most important medium of pathogen transfer in the spread of highly infectious diseases; hand washing is a method of social vaccination and similar to vaccination. When you wash your hands, you are protecting yourself and others from being infected [6]. Washing hands with soap and running water is important, the temperature of the water does not matter much. The key is to make sure that you have clean, running water anytime you perform a hand hygiene procedure [7]. This is done by rubbing together the hands with soap and running water or with an antiseptic hand rub. Wearing gloves is not a substitute for washing hands [7].

The World Health Organization (WHO) introduced the five moments of hand-washing, before a clean/aseptic procedure, after exposure to patient body fluid, after touching patient surroundings [8] Washing your hands is easy, and one of the most effective ways to prevent the spread of germs. Clean hands can stop germs from spreading from one person to another, from your home and workplace to childcare facilities and hospitals. The following are the five steps of hand-washing, every time: Wet your hands with clean running water, turn off the tap, and apply soap; Lather your hands by rubbing them together with the soap; Lather the backs of your hands; between your fingers, and under your nails; Scrub your hands for at least 40 - 60 seconds and 20 secs for alcohol hand rub, to time yourself Hum the “Happy Birthday” song from beginning to end twice. Rinse your hands well under clean, running water. Dry your hands using a clean towel or disposable tissues or air dry them.

That’s why our hands are on the front lines in the war against Covid-19. The Nigerian Centers for Disease Control and Prevention (CDC) recommends wash-

ing hands with soap and water as the top way to clean our hands and in the absence of soap and water, a hand sanitizer with at least 60% alcohol can be used [9]. Unwashed hands are responsible for the spread of 80 percent of infectious diseases, according to medical experts [8]. Many people are ignorant of the impact of hand-washing on their health. Little do they know that the act that takes less than 60 seconds, can help save their lives? Unfortunately, awareness of the importance of hand-washing is still lacking.

In a study by Michigan State University researchers, it was found that only five percent (5%) of the participants washed their hands after using the bathroom and about ten percent of them didn't wash their hands at all [10]. They found that people only wash their hands, on average, for about six seconds. This is less than 15 and 20 seconds required for effective hand-washing practice. Dr. Christopher Lee reported that good hand hygiene is one of the key factors in restricting the transfer of microorganisms from sources of contamination. He says with proper techniques, the simple act of hand-washing with soap and water can significantly reduce the transmission of these pathogens [11]. Research done in Nigeria revealed that 82.4% of respondents had good knowledge of hand-washing and 17.6% had poor knowledge. Observations on the practice of hand-washing revealed that 42.2% of respondents always practiced hand washing and 34.3% practiced occasionally, while 23.5% never practiced hand washing [12]. In an observational study conducted among Health professionals in a Tertiary Hospital in Ghana, a hand-washing compliance rate ranging from 9.2% to 57% among doctors and 9.6% to 54% among nurses was reported [13]. A survey conducted at Jimma University Hospital in Southwest Ethiopia also showed that hand-washing practice by the nursing staff was inadequate. This study demonstrated that only 43.2% of the nursing staff practice adequate hand washing while 56.8% of them practice inadequate hand washing [14].

Hand washing is an easy procedure yet often overlooked by most Health care workers, it is a critical component of infectious disease prevention and control [15] [16] therefore key in the prevention of COVID-19 and other highly infectious diseases.

The aim of this study, therefore, is to assess the knowledge and investigate the practice of Health care workers in hand washing. This will limit the spread of COVID-19 at the Federal Medical Center Asaba Delta State.

2. Materials & Methods

This was a descriptive cross-sectional study conducted in Federal Medical Centre, Asaba [16] [17] in September 2020 for one month. The study participants were Health Care Workers, that is, doctors, nurses, pharmacist physiotherapists, laboratory scientists, and health attendants in the Centre. The Inclusion criteria were:

- 1) Those who have been in the employment of Federal Medical Centre for not less than 6 (six) months.

- 2) Those who were not in any way incapacitated.
- 3) Those who were willing to dispense information.
- 4) Those who gave consent and their confidentiality maintained.

Those who did not give consent were excluded from the study.

The sample size for the study was determined by using the formula for simple proportions [12].

$$N = \frac{(Z^2 PQ)^{23}}{D^2}$$

where:

N = the desired sample size.

Z = the standard normal deviate usually set at 1.96 (or more simply at 2), this corresponds to the 95 percent confidence level.

P = the proportion in the target population estimated to have a particular characteristic. Which will be 82.4% (0.824) as the proportion of respondents that had good knowledge of handwashing in a study carried out in Ikot Ekpene [12].

$Q = 1.0 - P = 0.176$.

D = Degree of accuracy desired, usually set at 0.05.

$$\begin{aligned} N &= \frac{1.96^2 \times 0.824 \times 0.176}{0.05^2} \\ &= \frac{3.8416 \times 0.824 \times 0.176}{0.0025} \\ &= 223 \end{aligned}$$

223 + 10% non-response ratio.

$N = 223 + 23 = 246$.

The total sample size was determined by the number of health care workers in the hospital nominal roll. The respondents were sampled by using a random sampling systematic method [18]. Proportional allocation was employed to compute the required sample size for each group of health workers, (Doctors 283, Nurses = 456, Pharmacist 52, Physiotherapist 8, Radiographers 9, Lab science 44, Health attendants 50 giving a total of 902).

Therefore:

A sample fraction was determined using the formula: Sample size/total number of respondents = proportionate ratio.

Proportionate ratio = $246/902 = 0.273$.

Therefore, using the proportionate ratio to multiply the total number for each category of a health care worker, will give a proportionate allocation.

Doctors $283 \times 0.273 = 77.259 \Omega 77$

Nurses = $456 \times 0.273 = 124.488 \Omega 124$

Pharmacist $52 \times 0.273 = 14.196 \Omega 14$

Physiotherapist $8 \times 0.273 = 2.184 \Omega 2$

Radiologist $9 \times 0.273 = 2.457 \Omega 2$

Lab science $44 \times 0.273 = 12.012 \Omega 12$

Health attendant = $50 \times 0.273 = 13.65 \Omega 14$

Total = 245 which is the sample size

Systematic random sampling [18] was used for each of the work groups. The sampling interval was derived using the formula below:

Sample interval = Total number of health workers/Sample size.

From the total list of health care workers in the different categories, a sampling ratio was calculated for each category:

Doctors $283/77 = 4$

Nurses = $456/124 = 4$

Pharmacist $52/14 = 4$

Physiotherapist $8/2 = 4$

Radiographer $9/2 = 4.5 \approx 5$

Lab science $44/12 = 4$

Health attendant = $50/14 = 4$

Therefore, a systematic random sampling method was used in selecting every 4th person in each category of a health care worker, except for radiographers who were 5th.

Data was gathered from 247 health professionals who worked at the Federal Medical Centre, Asaba, Nigeria and was analyzed using SPSS version 25, frequencies percentages, chi-square, and p values were also computed. The study was conducted by using a semi-structured interviewer-administered questionnaire [19] [20].

The Hospital had earlier set up an Infection, Prevention Committee, Which had one-week training on how to uphold the protocol on infection, prevention in January 2020. These training were stepped down to all the departments in the hospital in February 2020 for one month. The committee also supervises that there is the availability of soap and running water in the wards and recommended places in the hospital where such materials are placed for easy access to the Hospital Community. Six months later we decided to look at the knowledge and practice of Hand washing of the Healthcare workers in the Hospital.

Before the inception of the study, the nature and purpose of the study were explained to each respondent, and informed consent was obtained. The duration of the study was for September 2020.

The total number of questions to assess knowledge was ten (10) and each correct response was scored one (1) and for each wrong response zero (0). The total scores for each respondent were converted to percentage scores and a score of >80% was termed Excellent Knowledge, a score of 79% to 50% was good knowledge, and a score of <50% was poor knowledge.

The total number of questions for practice was fifteen (15) and each correct response was scored one (1) and for each wrong response zero (0), The total scores for each respondent were converted to percentage scores, and a score of >80% was termed excellent practice, a score of 79% to 50% was good practice and a score of <50% was poor practice.

Data were screened for completeness, entered, and analyzed using Statistical Package for Social Sciences (SPSS V. 20.0). With the help of a statistician, uni-variate analysis was carried out quantitative variables were presented using

mean and standard deviation and bi-variate analysis was carried out between the socio-demographic variables and knowledge and also the practice of respondents. The level of significance was set at $P < 0.05$.

Before the interview, the nature and purpose of the study were explained to each respondent, and informed consent was obtained.

Ethical permission to conduct this research was gotten from the Research and Ethics Committee and due processes in carrying out research in the hospital were observed and no harm or discomfort was caused to the participant during the questionnaire distribution. The privacy and confidentiality of the respondents were respected during the conduct of the research. Financial expenses were solely the researcher's obligations.

Maintenance of confidentiality: the research subject's names were not requested and information given was not divulged to other people but rather was treated with utmost secrecy and strictly for the research required.

3. Results

We enrolled 247 health workers in the study, about 66 (26.7%) were men while 181 (73.7%) were female. The ages of respondents ranged from <20 - 60 years of age, those who were <20 were 3 (1.2%) in number, those who were 21 - 30 were 77 (31.2%) in number, and 31 years to 40 were about 94 (38%), 41 - 50 yrs were 58 (23.5%) in number and lastly 51 - 60 were 15 (6.1%). Ninety-nine (40.1%) were singles, 146 (59.1%) were married and 2 (0.8%) were divorced. On the educational level, 20 (8.1%) had secondary education while 227 (91.9%) had tertiary education only. In the professional category, 78 (31.6%) were doctors, 125 (50.6%) were nurses, 14 (5.7%) were pharmacist, 12 (4.9%) were lab scientist, 2 (0.8%) were physiotherapist, radiologist were 2 (0.8%) health attendant were 14 (5.7%). Religion 232 (93.9%) were Christians and 15 (6.1%) were Muslims. Years of experience observed among health professionals with 0 - 5 years experience were 91 (36.8%), 6 - 10 years experience was 70 (28.3%), 11 - 15 years were 57 (23.1%), and lastly, and 16 - 20 years were 29 (11.7%) (**Table 1, Table 2**).

The majority of 227 (91.1%) study participants had good knowledge of hand washing (**Table 3**).

Two hundred and forty-four (98.8%) respondents had good practice of hand washing (**Table 4**).

Table 5 shows that Gender (chi-square = 5.243, p value = 0.022) and Profession (chi-square = 61.834, p-value = 0.001) of Health care worker have good Hand washing practice, while other socio-demographic variables were not statistically significant.

4. Discussion

This study examined the knowledge, and practice of hand washing among Health care workers in a tertiary hospital in Asaba. Results showed that the Majority of Healthcare workers were females (73.3%) of middle age (38.0%) group

Table 1. Socio-Demographic characteristics of the respondents'.

VARIABLE	FREQUENCY (N = 247)	PERCENTAGE 100%
Gender		
Male	66	26.7
Female	181	73.3
Age (in Years)		
<20	3	1.2
21 - 30	77	31.2
31 - 40	94	38.0
41 - 50	58	23.5
51 - 60	15	6.1
Marital Status		
Single	99	40.1
Married	146	59.1
Divorced	2	0.8
Profession		
Medical doctor	78	31.6
Nurse	125	50.5
Pharmacist	14	5.7
Lab scientist	12	4.9
Physiotherapist	2	0.8
Radiographers	2	0.8
Health attendants	14	5.7
Religion		
Christianity	232	93.9
Muslim	15	6.1
Traditional	0	0.0
Educational Level		
No formal education	0	0
Primary education	0	0
Secondary education	20	8.1
Tertiary education	227	91.9
Years of experience		
0 - 5	91	36.8
6 - 10	70	28.3
11 - 15	57	23.1
16 - 20 above	29	11.8

Table 2. Practice of Hand-washing among the respondent.

PRACTICE QUESTIONS	YES	NO
Do you wash your hands on arrival at work?	73.7%	26.3%
Hand hygiene should be practiced routinely even if gloves are worn	81.8%	18.2%
Hands should be washed at least for - seconds	20 - 40 se 82.6%	5 - 10 secs 17.4%

Continued

Health professionals should wash their hands with soap and water or alcohol-based hand rub before putting on or removal of gloves	92.7%	7.3%
Do you wash your hands before each contact with patients?	47.8%	52.2%
Do you moisten your hands with water before applying soap?	59.9%	40.1%
Do you sometimes use alcohol-based hand rub for hand hygiene	45.3%	54.7%
Do you wash your hands before leaving the hospital?	67.6%	32.4%
Do you wash your hands before and after each contact with the patients?	91.1%	8.9%
Do you propose that hand washing posters should be in every ward	83.8%	16.2%
Do you recommend that hand washing training be done quarterly for HCWs	80.1%	19.9%
Have you attended a seminar/training on hand washing in your facility?	76.1%	23.9%
Do you have sufficient knowledge of hand washing?	81.0%	19.0%
Do you dry your hands after hand hygiene?	51.8%	48.2%

Table 3. Aggregate score of health care workers on knowledge of hand washing aggregate score.

Knowledge	Frequency	Percent (%)
Excellent knowledge	20	8.10
Good Knowledge	227	91.9
Poor Knowledge	0	0
Total	247	100

Table 4. Aggregate practice (%) group of health care workers on hand washing.

Practice	Frequency	Percent (%)
Excellent practice	3	1.2
Good practice	244	98.8
Poor practice	0	0.0
Total	247	100

who were married (59.1%). The study also showed that most of the staff attended tertiary (91.9%) education and hence were trainable. We observed that they had good knowledge (91.1%) and practice (98.8%) of hand washing in the survey, probably due to the training sessions organized by the Infectious disease prevention committees six months earlier before the study [20].

This good knowledge will help the health professionals to adhere to needed infection and disease control measures. Again almost everyone knew that effective hand washing consists of wetting, soaping, applying friction, rinsing, and drying adequately this will enhance hand washing practice at the point of care.

Table 5. Socio-demographic relationship with practice of hand washing.

Variables	Aggregate Score			Chi-square	p-value
	Excellent practice (%)	Good practice (%)	Poor practice (%)		
Gender				5.243	0.022
Male	1 (1.5)	65 (98.5)	0		
Female	19 (11.7%)	162 (89.5)	0		
Age				0.925	0.9
<20 years	0 (0)	3 (100%)	(0)		
21 - 30	1 (1.3)	76 (98.7)	0 (0)		
31 - 40	1 (1.1)	93 (98.9)	0 (0)		
41 - 50	0 (0)	58 (100)	0 (0)		
51 - 60	0 (0)	15 (100)	0 (0)		
Educational level				1.78	0.7
No formal education	0 (0)	0 (0)			
Primary education	0 (0)	0 (0)			
Secondary education	0 (0)	20 (100)			
Tertiary education	2 (0.9)	225 (99.1)			
Profession				61.834	0.001
Medical Doctors	1 (1.3)	77 (98.7)	0 (0)		
Nurses	0 (0)	125 (100)	0 (0)		
Pharmacist	0 (0)	14 (100)	0 (0)		
Lab scientist	0 (0)	12 (100)	0 (0)		
Physiotherapist	0 (0)	2 (100)	0 (0)		
Radiography	1 (50)	1 (50)	0 (0)		
Health Attendants	(0)	14 (100)	0 (0)		
Years of experience				1.947	0.6
0 - 5 yrs	0 (0)	91 (100)	0 (0)		
6 - 10 yrs	1 (1.4)	69 (98.6)	0 (0)		
11 - 15	1 (1.8)	56 (98.2)	0 (0)		
16 - 20	0 (0)	29 (100)	0 (0)		

This will help with risk assessment at the point of care which will therefore aid in promoting safe and efficient care for patients, thus minimizing risk to care providers and consumers of health (Table 2). Consequently, this will lead to less infection and fewer hospital stays. In the study 76.1% who participated agreed that they have attended a seminar on hand washing, which contributed to the overall practice of hand washing. More so 80.1% proposed a quarterly hand washing seminar in the center, this is because training and retraining of workers periodically improved practice [20]. And 83.8% of participants suggested that hand washing posters should be placed in every unit in the hospital probably as a reminder of various steps in hand hygiene. This good practice will culminate in better perception, favorable attitude, skills, and subsequently good hand washing practices, which will help in averting, preventing, and transmission of diseases. This limits outbreaks of infections in the hospital, community, and nation at large therefore breaking down the chain of transmission. Furthermore, good

hand washing knowledge and practice will bring about a reduced hospital stay, leading to a decrease in the rate of Hospital-acquired infection (HAI), Anti-microbial resistance (AMR), and better Anti-microbial stewardship (AMS). This will lead to a fewer hospital stay for patients, reduced loss of income, and less financial burden to patients. It will therefore reduce morbidity and mortality which will inadvertently increase the life-expectancy rate.

The study done in Nigeria revealed that 82.4% of respondents had good knowledge of hand-washing and 42.2% of respondents always practiced good hand washing [12]. In an observational study conducted among Healthcare Providers in a Tertiary Hospital in Ghana [13], a hand washing compliance rate ranges from 9.2% to 57% among doctors and 9.6% to 54% among nurses. A study conducted in Ethiopia also indicated that the practice of hand washing by the nursing staff was inadequate [15]. This confirmed that only 43.2% of the nursing staff practice adequate hand washing while 56.8% of them practice inadequate hand washing, contrary to our study where nurses had a 100% rate of Hand washing practice. Other professions also had good hand washing practice, even health attendance (100%). Despite their level of education, their performance may not be unconnected with the regular training they receive from Infection, Prevention Committee [20].

Profession and gender had a positive correlation with hand washing practice in this study. (chi-square = 5.243, p value = 0.022 and chi square = 61.834, p-value = 0.001 respectively) Profession probably because of their training's in their respective disciplines and also because of the recent workshop organized in the hospital. The professionals in the study were health workers like doctors, nurses pharmacists, physiotherapists, laboratory scientists, and lastly cleaners. their responsibility includes preventing disease, prolonging life, and promoting health through managing patients' health state through prescribing, investigating, promoting, and keeping the hospital clean among many duties, While gender also correlated in this Male (98.5%) had good hand washing practice than females (89.5%). A study was conducted to determine the gender differences in the mean score of knowledge, attitude, and practice to hand hygiene among Saudi Nursing Students. The mean score showed that males (21.33) [21] have better practice than females (19.99) p value = 0.025, While females (37.53) have a better attitude and behavior than their male (35.43) counterparts value = 0.016. In this study, gender was statistically relevant, probably because there are more nurses in the study who were mostly females, it may also be because women are more domesticated than men, or because nurses wash their hands more frequently due to their daily routine like bed bath, bed making, and wound dressing. Males though have good hand washing practices and need more encouragement than women to engage in proper hand washing behavior and compliance to hand hygiene [21]. Factors that may promote hand washing in a study by Chittleborough *et al.* in a primary school includes, no time to wash hands, unappealing facilities for hand washing, pitiable grownup model on hand washing, also another study done by Bahri Teker *et al.* In 2015 a private hospital in Turkey showed that doctors, nurses, and health assistants that were trained in

hand hygiene before meeting patients had high adherence to hand washing, unlike the same professionals who were untrained., in a study in Nigeria, training, and re-training of workers periodically improved practice [20]. The study was limited in that responses on the practice of hand washing were not observed or verified by participants since they were self-reported.

5. Conclusions

In conclusion, this study found that there is a good hand washing practice in Federal Medical Centre Asaba. The majority of Health Care Workers had good knowledge and practice of hand washing. Profession and Gender of participants were statistically related to hand washing practice.

We recommend that a hand washing workshop/seminar by Infection, Prevention Committee should be carried out periodically. Posters/newsletters on hand washing should be placed at strategic points and units. Hand sanitation commodities are made readily available in all units in the hospital, thereby promoting consciousness and congruent efforts by health care workers on maintaining good hand washing practices. This will prevent hospital-acquired infections and especially limit the spread of Covid-19. Also, further research should be done to determine predictors of good hand washing practice in Nigeria. This could lead to a major policy change in enhancing the quality of Infection Prevention Committee performance in our Hospitals.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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